

January 12, 2006
5928-06-20364

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Three Mile Island, Unit 1 (TMI Unit 1)
Facility Operating License No. DPR-50
NRC Docket No. 50-289

Subject: Three Mile Island, Unit 1 Sixty-Day Response to the Reporting Requirements of NRC Order EA-03-009, "Issuance of First Revised Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads"

- References:
- 1) Letter from USNRC, "Issuance of First Revised Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads At Pressurized Water Reactors," dated February 20, 2004
 - 2) Letter from K. R. Jury to USNRC, "Answer to First Revised NRC Order (EA-03-009) to Modify Licenses Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads," dated March 9, 2004

The purpose of this letter is to provide the TMI Unit 1 sixty-day response to the reporting requirements listed in Section IV, paragraph E, of Reference 1. TMI Unit 1 consented to the First Revised Order EA-03-009 (Order) in Reference 2. The results of the visual inspections required by Section IV, paragraph D, of the Order are provided in the attachment to this letter. These inspections were performed during the recent TMI Unit 1 1R16 refueling outage, which concluded on November 18, 2005. As stated in Section IV, paragraph E, of the Order, this report is being submitted within sixty (60) days after the unit has been returned to service, due to the NRC by January 17, 2006.

No new regulatory commitments are established by this submittal. If any additional information is needed, please contact David J. Distel at (610) 765-5517.

Sincerely,



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Pamela B. Cowan
Director - Licensing & Regulatory Affairs
AmerGen Energy Company, LLC

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Attachment: Results of the 1R16 (Fall 2005) Visual Inspections of the TMI Unit 1
Reactor Vessel Head

cc: S. J. Collins, USNRC Administrator, Region I
F. E. Saba, USNRC Project Manager, TMI Unit 1
D. M. Kern, USNRC Senior Resident Inspector, TMI Unit 1
File No. 02048

ATTACHMENT

Results of the 1R16 (Fall 2005) Visual Inspections of the TMI Unit 1 Reactor Vessel Head

The current TMI Unit 1 reactor vessel head was manufactured by Framatome and contains seventy-one vessel head penetrations (VHPs). These penetrations include one reactor head vent pipe penetration, one Reactor Coolant Inventory Tracking System (RCITS) penetration, and sixty-nine control rod drive mechanism (CRDM) penetrations. The new reactor head was installed during the Fall 2003 refueling outage. The susceptible alloy 600 material was replaced with alloy 690 base material and associated weld metals 52 and 152 that are more resistant to PWSCC issues. There have been no repairs to the new reactor head and the first required bare metal inspection is scheduled for the Fall 2007 refueling outage. Per the NRC Order, the TMI Unit 1 RPV head is designated as a Replaced category head.

The examinations of the TMI Unit 1 reactor pressure vessel (RPV) head during the 1R16 (Fall 2005) refueling outage were performed in accordance with the requirements contained in the First Revised NRC Order EA-03-009 (Order), Section IV, paragraph D.

Paragraph IV.D of the Order states:

During each refueling outage, visual inspections shall be performed to identify potential boric acid leaks from pressure-retaining components above the RPV head. For any plant with boron deposits on the surface of the RPV head or related insulation, discovered either during the inspections required by this Order or otherwise and regardless of the source of the deposit, before returning the plant to operation the Licensee shall perform inspections of the affected RPV head surface and penetrations appropriate to the conditions found to verify the integrity of the affected area and penetrations.

VISUAL EXAMINATION RESULTS

During the TMI Unit 1 Fall 2005 refueling outage (1R16), boric acid walk downs were performed with the unit in cold shutdown condition. The walk downs were performed in accordance with the requirements of the TMI Unit 1 Boric Acid Corrosion Control program and paragraph IV.D of the Order. Minor boric acid indications of dry boric acid residue (staining) on the east side of the reactor head and on the underside of the mirror insulation were observed. The results of the walk downs were documented under the TMI Unit 1 corrective action program.

The amount of boric acid found during this exam only involved staining of the mirror insulation and reactor head below the mirror insulation. This boric acid residue was a direct result of CRDM closure leakage and venting operations from the reactor fill and vent during the Fall 2003 outage/start up. This Fall 2003 leakage had been documented under the TMI Unit 1 corrective action program, which documented a small pool of water on the east side of the mirror insulation, that was later determined to be reactor coolant borated water from fill and vent, and also stator cooling water leakage. The physical characteristics of the reactor head staining noted that the heavier staining was at the end of the stain near the outer edge of the reactor head. If the boric acid staining had been caused by a leak during operation, the heavier concentration most likely would be near the source of the leak due to the high temperature and rapid loss of water content.

ATTACHMENT

Results of the 1R16 (Fall 2005) Visual Inspections of the TMI Unit 1 Reactor Vessel Head

A thorough visual inspection was performed on all sixty-nine CRDM flanges (above the mirror insulation). One CRDM flange was deemed to have a small leak at the gasket area. No boron was seen on the CRDM nozzle (under the mirror insulation) of the leaking CRDM flange. The leak was very small, and based on the visual inspection of the area, it is unlikely that any of the CRDM flange leakage was associated with the boric acid staining on the reactor head. The CRDM flange gasket was replaced during the outage and no leakage was observed during the VT-2 inspection during start up. The results of the CRDM flange leak were documented under the TMI Unit 1 corrective action program. In addition, a small amount of boron staining was noted on three other CRDMs that was attributed to the venting leakage since there was no boron in the CRDM/nozzle flange (gasket) area.

Isotopic analysis was performed on two smear samples taken from the reactor head stained area. The gamma spectroscopy results of the smear sample analysis indicated there were no short-lived radionuclides associated with the reactor head boric acid stain, and subsequently no active leakage. The reactor head was installed in the Fall 2003 refueling outage and any boric acid staining is no older than 2 years. As noted earlier, a review of previous work history determined CRDM closure and vent leakage occurred during the start up fill and vent operation in 2003.

A bare metal examination of the affected reactor head areas and CRDM penetrations (17 CRDMs inspected 360° and 9 CRDMs inspected 180°) was performed. No evidence of degradation on the head surface or CRDMs was noted. The CRDM flange gasket was repaired and the reactor head area was subsequently cleaned.